

I. CIVIL WAR ARMIES

Organization

The U.S. Army in 1861

The Regular Army of the United States on the eve of the Civil War was essentially a frontier constabulary whose 16,000 officers and men were organized into 198 companies scattered across the nation at seventy-nine different posts. At the start of the war, 183 of these companies were either on frontier duty or in transit, while the remaining 15, mostly coastal artillery batteries, guarded the Canadian border and Atlantic coast or one of the twenty-three arsenals. In 1861, this Army was under the command of Lieutenant General Winfield Scott, the seventy-five-year-old hero of the Mexican-American War. His position as general in chief was traditional, not statutory, because secretaries of war since 1821 had designated a general to be in charge of the field forces without formal Congressional approval. The field forces themselves were controlled through a series of geographic departments whose commanders reported directly to the general in chief. This department system, frequently modified, would be used by both sides throughout the Civil War for administering regions under army control.

Army administration was handled by a system of bureaus whose senior officers were, by 1860, in the twilight of long careers in their technical fields. Six of the ten bureau chiefs were over seventy years old. These bureaus, modeled after the British system, answered directly to the War Department and were not subject to the orders of the general in chief. Predecessors of many of today's combat support and combat service support branches, the following bureaus had been established by 1861:

Quartermaster	Medical
Ordnance	Adjutant General
Subsistence	Paymaster
Engineer	Inspector General
Topographic Engineer*	Judge Advocate General

*(Merged with the Engineer Bureau in 1863.)

During the war, Congress elevated the Office of the Provost Marshal and the Signal Corps to bureau status and created a Cavalry Bureau. Note that no operational planning or intelligence staff existed: American commanders before the Civil War had never required such a structure.

This system provided suitable civilian control and administrative support to the small field army prior to 1861. Ultimately, the bureau system would respond effectively, if not always efficiently, to the mass mobilization required over the next four years. Indeed, it would remain essentially intact until the early twentieth century. The Confederate government, forced to create an army and support organization from scratch, established a parallel structure to that of the U.S. Army. In fact, many important figures in Confederate bureaus had served in one of the prewar bureaus.

Raising the Armies

With the outbreak of war in April 1861, both sides faced the monumental task of organizing and equipping armies that far exceeded the prewar structure in size and complexity. The Federals maintained control of the Regular Army, and the Confederates initially created a regular force, mostly on paper. Almost immediately, the North lost many of its officers to the South, including some of exceptional quality. Of 1,108 Regular officers serving as of 1 January 1861, 270 ultimately resigned to join the South. Only a few hundred of the 15,135 enlisted men, however, left the ranks.

The Federal government had two basic options for the use of the Regular Army. It could be divided into training and leadership cadre for newly formed volunteer regiments or be retained in units to provide a reliable nucleus for the Federal Army in coming battles. At the start, Scott envisioned a relatively small force to defeat the rebellion and therefore insisted that the Regulars fight as units. Although some Regular units fought well, at the First Battle of Bull Run and in other battles, Scott's decision ultimately limited the impact of regular units upon the war. Battle losses and disease soon thinned the ranks of Regulars, and officials could never recruit sufficient replacements in the face of stiff competition from the states, which were forming volunteer regiments. By November 1864, many Regular units had been so depleted that they were withdrawn from front-line service. The war, therefore, was fought primarily with volunteer officers and men, the vast majority of whom had no previous military training or experience.

Neither side had difficulty in recruiting the numbers initially required to fill the expanding ranks. In April 1861, President Abraham Lincoln called for 75,000 men from the states' militias for a three-month period. This figure probably represented Lincoln's informed guess as to how many troops would be needed to quell the rebellion quickly. Almost 92,000 men responded, as the states recruited their "organized" but untrained militia companies. At the First Battle of Bull Run in July 1861, these ill-trained and poorly equipped soldiers generally fought much better than they were led. Later, as the war began to require more manpower, the Federal government set enlisted quotas through various "calls," which local districts struggled to fill. Similarly, the Confederate Congress, in March 1861, authorized the acceptance of 100,000 one-year volunteers. One-third of these men was under arms within a month. The Southern spirit of voluntarism was so strong that possibly twice that number could have been enlisted, but sufficient arms and equipment were not then available.

As the war continued and casualty lists grew, the glory of volunteering faded, and both sides ultimately resorted to conscription to help fill the ranks. The Confederates enacted the first conscription law in American history in April 1862, followed by the Federal government's own law in March 1863. Throughout these first experiments in American conscription, both sides administered the programs in less than a fair and efficient way. Conscription laws tended to exempt wealthier citizens, and initially, draftees could hire substitutes or pay commutation fees. As a result, the health, capability, and morale of the average conscript were poor. Many eligible men, particularly in the South, enlisted to avoid the onus of being considered a conscript. Still, conscription or the threat of conscription ultimately helped provide a sufficient quantity of soldiers for both sides.

Conscription was never a popular program, and the North, in particular, tried several approaches to limit conscription requirements. These efforts included offering lucrative bounties (fees) to induce volunteers to fill required quotas. In addition, the Federals offered a series of reenlistment bonuses, including money, thirty-day furloughs, and the opportunity for veteran regiments to maintain their colors and be designated as "veteran" volunteer infantry regiments. The Federals also created an Invalid Corps (later renamed the Veteran Reserve Corps) of men unfit for front-line service who performed essential rear-area duties. The Union also recruited almost 179,000 blacks,

mostly in federally organized volunteer regiments. By February 1864, blacks were being conscripted in the North as well. In the South, the recruiting or conscripting of slaves was so politically sensitive that it was not attempted until March 1865, far too late to influence the war.

Whatever the faults of the manpower mobilization, it was an impressive achievement, particularly as a first effort on that scale. Various enlistment figures exist, but the best estimates are that approximately two million men enlisted in the Federal Army during 1861-65. Of that number, 1 million were under arms at the end of the war. Because Confederate records are incomplete or lost, estimates of their enlistments vary from 600,000 to over 1.5 million. Most likely, between 750,000 and 800,000 men served the Confederacy during the war, with a peak strength never exceeding 460,000. Perhaps the greatest legacy of the manpower mobilization efforts of both sides was the improved Selective Service system that created the armies of World Wars I and II.

The unit structure into which the expanding armies were organized was generally the same for Federals and Confederates, reflecting the common roots for both armies. The Federals began the war with a Regular Army organized into an essentially Napoleonic, musket-equipped structure. Each of the ten prewar infantry regiments consisted of ten 87-man companies with a maximum authorized strength of 878. At the beginning of the war, the Federals added nine Regular infantry regiments with a newer "French Model" organizational structure. The new regiments contained three battalions, with a maximum authorized strength of 2,452. The new Regular battalion, with eight 100-man companies, was, in effect, equivalent to the prewar regiment. Essentially an effort to reduce staff officer slots, the new structure was unfamiliar to most leaders, and both sides used a variant of the old structure for newly formed volunteer regiments. The Federal War Department established a volunteer infantry regimental organization with a strength that could range from 866 to 1,046 (varying in authorized strength by up to 180 infantry privates). The Confederate Congress fixed its ten-company infantry regiment at 1,045 men. Combat strength in battle, however, was always much lower because of casualties, sickness, leaves, details, desertions, and straggling.

The battery remained the basic artillery unit, although battalion and larger formal groupings of artillery emerged later in the war in the eastern theater. Four understrength Regular regiments existed in the

U.S. Army at the start of the war, and one Regular regiment was added in 1861, for a total of sixty batteries. Nevertheless, most batteries were volunteer organizations. A Federal battery usually consisted of six guns and had an authorized strength of 80 to 156 men. A battery of six twelve-pounder Napoleons could include 130 horses. If organized as "horse" or flying artillery, cannoneers were provided individual mounts, and more horses than men could be assigned to the battery. Their Confederate counterparts, plagued by limited ordnance and available manpower, usually operated with a four gun battery, often with guns of mixed types and calibers. Confederate batteries seldom reached their initially authorized manning level of 80 soldiers.

Prewar Federal mounted units were organized into five Regular regiments (two dragoon, two cavalry, and one mounted rifle), and one Regular cavalry regiment was added in May 1861. Originally, ten companies comprised a regiment, but congressional legislation in July 1862 officially reorganized the Regular mounted units into standard regiments of twelve "companies or troops" of 79 to 95 men each. Although the term "troop" was officially introduced, most cavalymen continued to use the more familiar term "company" to describe their units throughout the war. The Federals grouped two companies or troops into squadrons, with four to six squadrons making a regiment. Confederate cavalry units, organized on the prewar model, authorized ten 76-man companies per regiment. Some volunteer cavalry units on both sides also formed into smaller cavalry battalions. Later in the war, both sides began to merge their cavalry regiments and brigades into division and corps organizations.

For both sides, unit structure above regimental level was similar to today's structure, with a brigade controlling three to five regiments and a division controlling two or more brigades. Federal brigades generally contained regiments from more than one state, while Confederate brigades often had several regiments from the same state. In the Confederate Army, a brigadier general usually commanded a brigade, and a major general commanded a division. The Federal Army, with no rank higher than major general until 1864, often had colonels commanding brigades and brigadier generals commanding divisions.

The large numbers of organizations formed, as shown in table 1, are a reflection of the politics of the time. The War Department in 1861 considered making recruiting a Federal responsibility, but this proposal seemed to be an unnecessary expense for the short war initially envisioned. Therefore, responsibility for recruiting remained

with the states, and on both sides, state governors continually encouraged local constituents to form new volunteer regiments. This practice served to strengthen support for local, state, and national politicians and provide an opportunity for glory and high rank for ambitious men. Although such local recruiting created regiments with strong bonds among the men, it also hindered filling the ranks of existing regiments with new replacements. As the war progressed, the Confederates attempted to funnel replacements into units from their same state or region, but the Federals continued to create new regiments. Existing Federal regiments detailed men back home to recruit replacements, but these efforts could never successfully compete for men joining new local regiments. Thus, the newly formed regiments had no seasoned veterans to train the recruits, and the battle-tested regiments lost men faster than they could recruit replacements. Many regiments on both sides were reduced to combat ineffectiveness as the war progressed. Seasoned regiments were often disbanded or consolidated, usually against the wishes of the men assigned.

Table 1. Federal and Confederate Organized Forces

	<i>Federal</i>		<i>Confederate</i>	
Infantry	19	Regular Regiments	642	Regiments
	2,125	Volunteer Regiments	9	Legions*
	60	Volunteer Battalions	163	Separate Battalions
	351	Separate Companies	62	Separate Companies
Artillery	5	Regular Regiments	16	Regiments
	61	Volunteer Regiments	25	Battalions
	17	Volunteer Battalions	227	Batteries
	408	Separate Batteries		
Cavalry	6	Regular Regiments	137	Regiments
	266	Volunteer Regiments	1	Legion*
	45	Battalions	143	Separate Battalions
	78	Separate Companies	101	Separate Companies

*Legions were a form of combined arms team, with artillery, cavalry, and infantry. They were approximately the strength of a large regiment. Long before the end of the war, legions lost their combined arms organization.

The Leaders

Because the organization, equipment, tactics, and training of the Confederate and Federal Armies were similar, the performance of units in battle often depended on the quality and performance of their leaders. General officers were appointed by their respective central governments. At the start of the war, most, but certainly not all, of the more senior officers had West Point or other military school experience. In 1861, Lincoln appointed 126 general officers, of which 82 were, or had been, professional officers. Jefferson Davis appointed 89, of which 44 had received professional training. The remainder were political appointees, but of these only sixteen Federal and seven Confederate generals had no military experience.

Of the volunteer officers who composed the bulk of the leadership for both armies, colonels (regimental commanders) were normally appointed by state governors. Other field grade officers were appointed by their states, although many were initially elected within their units. Company grade officers were usually elected by their men. This long-established militia tradition, which seldom made military leadership and capability a primary consideration, was largely an extension of the states rights philosophy and sustained political patronage in both the Union and the Confederacy.

Much has been made of the West Point backgrounds of the men who ultimately dominated the senior leadership positions of both armies, but the graduates of military colleges were not prepared by such institutions to command divisions, corps, or armies. Moreover, though many leaders had some combat experience from the Mexican War era, few had experience above the company or battery level in the peacetime years prior to 1861. As a result, the war was not initially conducted at any level by "professional officers" in today's terminology. Leaders became more professional through experience and at the cost of thousands of lives. General William T. Sherman would later note that the war did not enter its "professional stage" until 1863.

Civil War Staffs

In the Civil War, as today, the success of large military organizations often depended on the effectiveness of the commanders' staffs. Modern staff procedures have evolved only gradually with the increasing complexity of military operations. This evolution was far from complete in 1861, and throughout the war, commanders

personally handled many vital staff functions, most notably operations and intelligence. The nature of American warfare up to the mid-nineteenth century had not yet clearly overwhelmed the capabilities of single commanders.

Civil War staffs were divided into a "general staff" and a "staff corps." This terminology, defined by Winfield Scott in 1855, differs from modern definitions of the terms. Table 2 lists typical staff positions at army level, although key functions are represented down to regimental level. Except for the chief of staff and aides-de-camp, who were considered personal staff and would often depart when a commander was reassigned, staffs mainly contained representatives of the various bureaus, with logistical areas being best represented. Later in the war, some truly effective staffs began to emerge, but this was a result of the increased experience of the officers serving in those positions rather than a comprehensive development of standard staff procedures or guidelines.

Table 2. Typical Staffs

General Staff

Chief of staff

Aides

Assistant adjutant general

Assistant inspector general

Staff Corps

Engineer

Ordnance

Quartermaster

Subsistence

Medical

Pay

Signal

Provost marshal

Chief of artillery

George B. McClellan, when he appointed his father-in-law as his chief of staff, was the first to use this title officially. Even though many senior commanders had a chief of staff, this position was not used in any uniform way, and seldom did the man in this role achieve the central, coordinating authority of the chief of staff in a modern headquarters. This position, along with most other staff positions, was used as an individual commander saw fit, making staff responsibilities somewhat different under each commander. This inadequate use of the chief of staff was among the most important shortcomings of staffs during the Civil War. An equally important weakness was the lack of any formal operations or intelligence staff. Liaison procedures were also ill-defined, and various staff officers or soldiers performed this function with little formal guidance. Miscommunication or lack of knowledge of friendly units proved disastrous time after time.

The Armies at Vicksburg

Major General Ulysses S. Grant's Army of the Tennessee was organized into four infantry corps. Major General Stephen A. Hurlbut's XVI Corps, however, remained headquartered in Memphis performing rear-area missions throughout the campaign, although nearly two divisions did join Grant during the siege. The remaining three corps, containing ten divisions with over 44,000 effectives, composed Grant's maneuver force during the campaign. Although some recently recruited "green" regiments participated, the bulk of Grant's army consisted of veteran units, many of which had fought with distinction at Forts Henry and Donelson, Shiloh, and Chickasaw Bayou. Of Grant's senior subordinates, the XV Corps commander, Major General William T. Sherman, was his most trusted. Ultimately to prove an exceptional operational commander, Sherman was an adequate tactician with considerable wartime command experience. He and Major General James B. McPherson, commander of XVII Corps, were West Pointers. McPherson was young and inexperienced, but both Grant and Sherman felt he held great promise. Grant's other corps commander, Major General John A. McClernand, was a prewar Democratic congressman who had raised much of his XIII Corps specifically so that he could command an independent Vicksburg expedition. A self-serving and politically ambitious man who neither enjoyed nor curried Grant's favor, he nonetheless was an able organizer and tactical commander who had served bravely at Shiloh. The division commanders were a mix of trained regular officers and

volunteers who formed a better-than-average set of Civil War commanders.

Lieutenant General John C. Pemberton, a Pennsylvania-born West Pointer who had served with Jefferson Davis in the Mexican War, resigned his federal commission to join the South at the start of the war. Pemberton's army in the Vicksburg campaign consisted of five infantry divisions with no intermediate corps headquarters. Counting two brigades that briefly joined Pemberton's command during the maneuver campaign, he had over 43,000 effectives, many of whom had only limited battle experience. Of Pemberton's subordinates, Brigadier General John S. Bowen, a West Point classmate of McPherson's, was an exceptionally able tactical commander. Major General Carter L. Stevenson was also West Point trained, and the other division commander in the maneuver force, Major General William W. Loring, was a prewar Regular colonel who had worked his way up through the ranks. Significantly, none of these three men had any real respect for their commander and would prove to be less than supportive of him. Pemberton's other division commanders, Major Generals Martin L. Smith and John H. Forney, both West Pointers, would remain in or near the city, commanding Vicksburg's garrison troops throughout the campaign.

Although Pemberton's five divisions represented the main Confederate force in the Vicksburg campaign, his army came under the jurisdiction of a higher headquarters, General Joseph E. Johnston's Department of the West. Johnston, in 1861, had been the Quartermaster General of the Regular Army and one of only five serving general officers. He had commanded in the eastern theater early in the war until severely wounded. In November 1862 after several months of convalescence, he assumed departmental command in the west. Johnston assumed direct command in Mississippi on 13 May 1863 but was unable to establish effective control over Pemberton's forces. When Pemberton became besieged in Vicksburg, Johnston assembled an Army of Relief but never seriously threatened Grant.

Morale of the troops was a serious concern for both the Union and Confederate commanders. Grant's army suffered terribly from illness in the early months of the campaign, which it spent floundering in the Louisiana swamps. But the men recovered quickly once they gained the high ground across the river. Inured to hardship, these men were served by able commanders and hardworking staffs. Once movements started, morale remained high, despite shortfalls in logistical support.

Pemberton's men, although not always well served by their commanders, fought hard for their home region through the battle of Champion Hill. Although they briefly lost their resolve after that defeat, once behind the formidable works at Vicksburg, they regained a level of morale and effectiveness that only began to erode weeks later when they were faced with ever-increasing Federal strength and their own supply shortages.

Table 3. Confederate and Federal Effective Strengths in the Vicksburg Campaign, 30 April-4 July 1863

(Numbers Approximate)

Confederate			
<i>Pemberton</i>			<i>Johnston</i> (arrives 13 May)
1 May	43,600		
3 May	+3,200 Gregg's Brigade		
13 May	-3,200 Gregg to Johnston	+5,900	Gregg + Wilson Bdes
17 May	-5,800 Loring to Johnston	+5,800	Loring
1-22 May	-7,400 casualties		
21 May		+5,900	Walker (-)
26 May		+4,400	Jackson
1 June		+9,100	Breckinridge
21 June		+7,500	French
23 May-3 July	-900 KIA During Siege	-2,300	Misc. Losses/Detachments
4 July	29,500 Surrendered	36,300	

Federal			
<i>Grant's Strength in Mississippi</i>			
30 April	28,800	XIII Corps + 3/XVII	
1 May	+5,100	7/XVII Corps	
6-7 May	+11,100	XV Corps (-)	
11 May	+5,900	2/XV	
1-22 May	-8,800	Casualties	
13-19 May	+4,200	6/XVII	
4-30 June	+27,400	IX Corps, XVI Corps (-), Herron's Division	
23 May-3 July	-500	Casualties during siege	
30 June	73,095	"Present for duty" at or near Vicksburg on return of this date (93,565 "aggregate present")	

Naval Power in the Vicksburg Campaign

Military Significance of the Rivers

Naval power was a decisive element in the western campaigns of the Civil War. Given the enormous size of the western theater of operations (680 miles in a straight line from Cairo, Illinois, to New Orleans) and the relative austerity of the road and rail nets, navigable waterways were the preferred method of movement for both commercial and military enterprises. In a situation analogous to twentieth-century "air superiority," control of the western rivers conferred significant military advantages, particularly with regards to mobility and firepower.

In an age when most military transportation moved by muscle power, the Mississippi River steamboat was a logistician's dream come true. Cargo capacity ranged from 250 tons for the smaller boats up to 1,700 for the largest. By contrast, a horse-drawn military wagon could move only about one ton, depending on the conditions of the roads. A Civil War-era freight train of ten cars might carry 100 tons of goods, but rail lines were few and difficult to maintain in the western theater. If camped on the banks of a navigable stream, a field army of 40,000 men and 18,000 horses could subsist handily on the daily deliveries of one large (500-ton) steamboat, which traveled on a river that was not vulnerable to sabotage and was rarely "out of order."

Moreover, riverboats could move the army itself. One riverboat could transport a regiment; ten could move an entire infantry division. Such troop movements might be operational in nature, such as the flow of reinforcements that came to Grant's army from other departments during the siege of Vicksburg; or tactical, as demonstrated during the Chickasaw Bayou battle when Sherman used riverboats to move troops from one part of the battlefield to another.

The rivers that moved supplies for the Army carried guns for the Navy—big guns, and lots of them. That portion of the Union's Mississippi squadron involved in the Vicksburg campaign possessed approximately 200 guns, which ranged from 24-pounder howitzers, to 11-inch smoothbores, and 100-pounder rifles. In comparison, Grant's army fielded 180 artillery pieces, mostly 12-pounders, when it first besieged Vicksburg. Pemberton's Confederates surrendered 172 pieces when the siege ended. Thus, the Mississippi River Squadron was by far the greatest source of artillery firepower in the theater.

It is important to understand that the Mississippi River was not a barrier to the Union ground forces involved in the Vicksburg campaign; rather, it was a superhighway. The free movement by river of both men and materiel was an essential precondition for Grant's campaign against Vicksburg. Conversely, when the Confederates lost the use of the rivers, their ability to wage war suffered. The U.S. Navy's presence along the Mississippi and its tributaries during the Vicksburg campaign seriously interfered with Confederate attempts to reinforce and resupply its ground elements opposing Grant. Unable to utilize water transport, the Confederates were forced to rely on the substandard roads and railroads. Moreover, the economic life of the Mississippi valley, and of the Confederacy as a whole, suffered significantly. Producers of commodities such as sugar and cotton were largely cut off from their markets in the east and overseas. By 1863, rather than producing cash crops that could not be transported, planters increasingly raised corn and hogs to feed themselves, commodities that they had imported by river before the war.

Confederate Naval Power

The U.S. Navy was able to exercise such pervasive control over the western rivers only because, by 1863, the Confederates lacked the means of challenging Union naval superiority. Such had not always been the case. In 1861, the Confederate War Department had established a "River Defense Fleet" in New Orleans, consisting of fourteen commercial riverboats converted into rams by strengthening their bows and stacking cotton bales on their decks as a form of armor (giving birth to the term "cottonclad"). Elsewhere on the Mississippi and its tributaries, about twenty-five other riverboats had artillery mounted on their decks making them into gunboats. Additionally, the Confederates laid keels for six new ironclad gunboats and began converting an existing boat into a seventh.

This imposing river force met with disaster in 1862. Two full-scale naval battles, one fought down river from New Orleans and the other upstream from Memphis, broke the back of Confederate naval power on the Mississippi. Every one of the fourteen rams of the River Defense Fleet was either destroyed in battle, captured, or burned to prevent capture. Only five of twenty-five gunboats survived into 1863, mostly by hiding upstream in such tributaries as the Red, Arkansas, White, and Yazoo Rivers. (Only one would remain by 1864.) The seven Confederate river ironclads fared little better. One was lost at the battle below New Orleans. Five were never commissioned, being

captured or destroyed to prevent capture while still under construction. Just one, the *Arkansas*, saw action. Although its combat career lasted only three weeks, the *Arkansas* demonstrated that even one Confederate ironclad loose upon the Mississippi posed an intolerable threat to Union naval superiority. Measuring 165 feet in length, armed with a ram bow and eight guns, and protected by wood and iron armor measuring eighteen inches in thickness, her Achilles heel proved to be the power plant driving her twin screws. The *Arkansas*' own crew scuttled her on 5 August 1862 after her steam engines failed.

Thus, at the time of the Vicksburg campaign, there were no Confederate ironclads and only a handful of gunboats on the western rivers. In fact, the greatest threat to the U.S. Navy during this campaign was that of its own vessels falling into enemy hands. In February 1863, two Union boats—the ram *Queen of the West* and the ironclad *Indianola*—ran downstream past the Vicksburg batteries. Confederates captured *Queen of the West* when she ran aground and then used her to disable *Indianola*, which they attempted to refloat. *Queen of the West* was later destroyed in action on the Atchafalaya River. The Confederates scuttled *Indianola* on 26 February when a Union “monitor” ran the Vicksburg batteries, as if on its way to recapture *Indianola*. This “monitor” was in fact an unmanned, unpowered barge rigged out to resemble an ironclad.

Essentially, the Confederacy's only means of asserting control over the Mississippi River in 1863 resided in the fortified batteries at Vicksburg, Grand Gulf, and Port Hudson. The absence of a credible Confederate river fleet greatly magnified the operational and strategic significance of these points. They were, in effect, a substitute for naval power.

The Mississippi River Squadron

The Union naval force that played such a large role in the Vicksburg campaign began its existence as an Army organization known as the Western Flotilla. In 1861, the War Department began to procure combat vessels both by converting commercial boats and by contracting for new construction. The U.S. Navy, which at first wanted little to do with the river war, provided officers and some of the crews, but the Army owned the boats. The first three commanders of the Western Flotilla, though Navy officers, took orders from the Army department commander.

On 1 October 1862, the flotilla transferred from Army to Navy control. (The Army, however, retained possession of the unarmed riverboats that it used as transports.) The flotilla was redesignated the Mississippi River Squadron and received a new commander, David D. Porter, later that month. Porter held the rank of Flag Officer, which (at that time) was equivalent to a major general. Later, Porter was promoted to the rank of acting rear admiral, which theoretically made him the highest-ranking Union officer in the theater—Grant was still a two-star general.

Neither Porter's rank nor the separation of the squadron from Army control altered the fact that the war in the Mississippi Valley was primarily an Army war. In practice, the ground force commander initiated the majority of joint operations. However, it was a wise general who kept his naval counterpart intimately involved in the planning process. Since the squadron commander no longer took orders from the Army, he could effectively veto any plan that he considered unfeasible. Thus, it was best not to surprise him with a scheme that had not received Navy input. Under these circumstances, only the mutual trust and respect between Army and Navy commanders prevented disagreements from escalating into deadlock. By 1863, Grant understood what Porter could and could not be asked to do, and Porter understood the type of support that the Army needed. Both Grant and Porter knew that if they failed to cooperate effectively, their superiors in Washington would be sure to intervene. Neither man desired that.

At the time of the Vicksburg campaign, the Mississippi River Squadron numbered approximately sixty combat vessels. Of these, about twenty to twenty-five would be involved in the Vicksburg operation at any given time. The remainder could be found patrolling the Cumberland and Tennessee Rivers, interdicting Confederate trade along the Mississippi, and undergoing repairs. A grand total of approximately thirty-three Union combat vessels participated in the Vicksburg campaign at one time or another—thirteen ironclads, seven rams, eleven light draughts (commonly called "tinclads"), and two "timberclads." The variety of vessel types reflects the diversity of missions that the squadron executed.

For heavy combat, the squadron relied upon its ironclads. Their firepower and armor protection allowed them to trade blows with any enemy, ashore or afloat. Seven of the squadron's ironclads were built to a common design, created for the War Department in 1861 by a U.S.

Navy “constructor” named Samuel M. Pook. James B. Eads of St. Louis won the contract to build the seven “City Class” ironclads, so called because each was named after a midwestern river town. The seven were the *Cairo*, *Carondelet*, *Cincinnati*, *Louisville*, *Mound City*, *Pittsburg*, and *St. Louis* (later renamed the *Baron De Kalb*).

One of the City Class boats, the *Cairo* (pronounced *Kay-row*), is on display at the Vicksburg National Military Park. Visitors are often surprised by how large the *Cairo* is—175 feet long and 51 feet wide. She had a draft of only six feet (meaning that she could float in six feet of water). Two steam engines driving a center-mounted paddlewheel propelled the vessel to a top speed of approximately six knots. For armament, the *Cairo* mounted three 7-inch rifles, three 8-inch smoothbores, six 32-pounder smoothbores, and one 30-pounder Parrot rifle. The guns were located in a slope-sided casemate with three ports facing forward, four to each side, and two to the stern. (Thus, unlike seagoing vessels of the day, which could fire half their guns at one time with each broadside, the ironclad could train only roughly one-fourth of its armament on a given target.) The casemate was protected by 2½ of iron armor fixed over timbers two feet thick. Railroad rails provided additional protection on the rounded corners of the casemate. The octagonal pilothouse carried 1¼ inch of iron over timbers. Armor was thickest on the forward surfaces. The rear of the vessel was essentially unarmored as were the underwater surfaces. The *Cairo* sank in December 1862 after a “torpedo” (mine) blew a hole in her hull.

Three other ironclads, the *Tuscumbia*, *Chillicothe*, and *Indianola* were, like the Eads boats, specially designed and constructed to be ironclad gunboats. Their builder was Joseph Brown of Cincinnati. Unlike the Eads vessels, these were poorly constructed, lightly armed, and imperfectly armored. *Tuscumbia* was the worst of the lot—her hull had a twist to it, the deck sagged, and her already-inadequate armor plates tended to fall off when struck by artillery. The *Tuscumbia* carried only five guns, the *Chillicothe* two, and the *Indianola* four.

Another three ironclads, *Choctaw*, *Lafayette*, and *Benton*, were converted from commercial riverboats. They were stronger, safer, and more effective than Joseph Brown’s vessels. Moreover, they were significantly larger than either the Eads or Brown ironclads. The *Choctaw* and *Lafayette* carried a layer of rubber, in addition to their iron armor, to help deflect projectiles (it did not work). The *Benton*, which sometimes served as Porter’s flagship, was the Mississippi

River Squadron's most powerful vessel. She measured 202 feet long by 72 feet wide, and carried sixteen guns.

The ironclads' primary mission during the Vicksburg campaign was to silence Confederate fortified batteries ashore. At one time or another, Union ironclads pounded Haynes' Bluff, Vicksburg's river batteries, and Grand Gulf. The ironclads subdued none of these positions, but the fact that the Confederates deemed it necessary to build major fortifications to house these batteries is itself testimony to the power of ironclad gunfire.

The approved tactic for bombarding a fort was to fight it head-on from the downstream side of the fort—head-on to take advantage of the ironclad's heaviest armor (located on the forward surfaces), and from the downstream direction because the boats handled better with their bows facing the current. Moreover, by approaching the fort from downstream, any vessel disabled by enemy fire would drift to safety, away from the enemy guns. The range of engagement could be quite short—the ironclads might close to within 100 yards of the fortification, blasting with grape and exploding shell in an attempt to break down the earthen parapet (front wall) of the fort and disable its guns.

Ironclads were also highly effective in combat against other vessels on those increasingly rare occasions when Confederate boats challenged the Mississippi River Squadron. However, a different category of vessels existed strictly for combat against other boats. These were the rams. In 1862, a civil engineer named Charles Ellet, Jr., obtained a colonel's commission and authorization from the War Department to convert nine riverboats into rams. The necessary modifications involved reinforcing their hulls and filling their bows with timber so that they could survive deliberate collisions with enemy boats. The Ellet ram fleet had its day of glory on 6 June 1862 when it played a prominent part in the naval victory at Memphis. But since they carried little or no armament other than their rams, Ellet's vessels were of limited utility once the Confederate fleet had ceased to be an immediate threat. Even so, six Ellet rams were on hand for the Vicksburg campaign: the *Lancaster*, *Lioness*, *Monarch*, *Queen of the West*, *Switzerland*, and *Fulton*. The Ellet ram fleet, which remained an Army organization, was not technically a part of the Navy squadron, although it operated under Porter's orders.

Porter did possess one ram of his own: a Confederate vessel sunk at Memphis in 1862 but salvaged and returned to duty under the U.S. flag. This was the *General Price*, which differed from the Ellet rams in that it carried four heavy guns, making it more useful in joint operations than Ellet's boats.

The light draught vessels, or "tinclads," were, like the rams, modified riverboats, but by 1863, they were much more important to the day-to-day business of the squadron. Tinclads provided the naval presence that kept waterways under Union control, even when the riverbanks belonged to the Confederates. The tinclads got their name from the iron plating, ½-inch to ¾-inch thick, that protected the power plant and pilot house from small-arms fire. To drive off "bushwhackers," the typical tinclad mounted six 24-pounder howitzers facing to the sides, more than enough firepower to cope with most threats. Tinclads could even double as troop transports in joint operations, each one carrying up to 200 infantry. Their shallow draft enabled them to prowl waterways inaccessible to heavier war vessels. Some tinclads could float on as little as eighteen inches of water when lightly loaded.

The Mississippi River Squadron possessed thirty-four tinclads in June 1863, ten of which played roles in the Vicksburg campaign: the *Cricket*, *Forest Rose*, *Juliet*, *Linden*, *Glide*, *Marmora*, *Petrel*, *Rattler*, *Romeo*, and *Signal*. In addition, the "large tinclad" *Black Hawk*, which mounted thirteen guns, and two "timberclads," *Lexington* (eight guns) and *Tyler* (ten guns) were involved in operations around Vicksburg.

If the tinclads were the most versatile, certainly the most specialized instruments at Porter's disposal were the mortar boats. These were unpowered scows or rafts, each carrying one squat, kettle-shaped 13-inch siege mortar. The mortar itself weighed 17,120 pounds. With a full 20-pound charge, it could lob a 200-pound shell a distance of over two miles. During the siege of Vicksburg, thirteen mortar boats anchored on the western side of De Soto point, from where they maintained a steady barrage against the invested city.

Naval Operations, 1863

By early 1863, Porter's Mississippi River Squadron controlled the Mississippi from St. Louis to Vicksburg. To the south, Rear Admiral David G. Farragut's Western Gulf Blockading Squadron dominated the river from its outlet to the Confederate fort at Port Hudson,

Louisiana. On 14 March 1863, Farragut succeeded in running upstream past Port Hudson in his flagship, the screw-sloop *Hartford*, in company with the small gunboat *Albatross*. The *Hartford* was powerful and fast, but being an ocean-going warship, she was ill-suited to conditions on the Mississippi. She measured 225 feet long by 44 feet wide and had a draft in excess of seventeen feet—far too deep for safe navigation on the western rivers. Her three masts looked absurd on the Mississippi, but her twenty-seven-gun armament commanded respect. Farragut's greatest contribution to the Vicksburg campaign was to blockade the mouth of the Red River until Porter's gunboats got below, thus severing a major military and commercial artery of the Confederacy.

On the night of 16-17 April 1863, Porter led a portion of the Mississippi River Squadron downstream past the batteries of Vicksburg in order to provide support and transportation for Grant's army, which was in the process of marching southward on the western side of the river. Seven ironclads ran the batteries—the *Carondelet*, *Pittsburg*, *Louisville*, *Mound City*, *Benton*, *Lafayette*, and *Tuscumbia*—along with one ram, the *General Price*, one tug, and three Army transports. Porter left behind the ironclad *De Kalb* and the tinclad fleet to keep the river safe upstream from Vicksburg. Two additional ironclads, the *Cincinnati* and *Choctaw*, arrived later from upriver to assist the *De Kalb*. The seven ironclads that ran the Vicksburg batteries tried, but failed, to silence the Confederate batteries at Grand Gulf on 29 April.

In May, when Grant's army crossed to the east bank of the Mississippi and marched inland, Porter subdivided the downstream portion of his force. The ironclads *Louisville*, *Tuscumbia*, *Mound City*, and *Carondelet* kept station at Grand Gulf, safeguarding Grant's line of communications. Porter himself led the ironclads *Benton*, *Lafayette*, and *Pittsburg*, plus the rams *General Price* and *Switzerland* (which had run the Vicksburg batteries in March), on operations up the Red River and its tributaries in conjunction with ground elements under Major General Nathaniel P. Banks. These joint operations on the Red River, plus the presence of ironclads at Grand Gulf, helped ensure that the Confederate defenders of Vicksburg received no reinforcements from west of the Mississippi during a critical period of the campaign.

In the last week of May, when Grant's army laid siege to Vicksburg by land, Porter's squadron besieged it by water. Not only did ironclads and mortarboats fire 11,500 projectiles in support of the siege, but also

Porter landed thirteen heavy cannon from his gunboats for the Army to use as siege artillery. These land batteries fired 4,500 rounds. And, of course, the squadron assured that supplies and reinforcements flowed to Grant's army without interference from the enemy.

The war on the western rivers did not end when Vicksburg fell to Grant on 4 July 1863. Union forces could occupy only key points along the Mississippi and other rivers. To the end of the war, "bushwhackers" and raiders continued to harass Union riverboat traffic, necessitating a continuous program of patrols and escorts by the tinclads and ironclads of the Mississippi River Squadron.

At war's end, however, the squadron vanished virtually without a trace. Whereas ocean-going vessels like the *Hartford* served on for years, even decades, the postwar Navy had no requirement whatsoever for a riverine force. Gunboats were converted (reconverted, in many cases) into commercial transports and steamed off into oblivion. Only the *Cairo*, encased in the protective muck of the Yazoo River for over a century, remains to illuminate a unique and fascinating chapter in American naval history.

Table 4. Mississippi River Squadron: Representative Vessels

Vessel Name	Type	Dimensions Length, Breadth, Draft	Armament	Armor (max)	Speed (knots)
<i>Cairo</i>	Ironclad (City Class)	175'/51'/6'	13 guns	2.5" Iron	6
<i>Tuscumbia</i>	Ironclad	178'/75'/7'	5 guns	6" Iron	8.6
<i>Chillicothe</i>	Ironclad	162'/50'/4'	2 guns	3" Iron	7
<i>Indianola</i>	Ironclad	175'/52'/5'	4 guns	3" Iron	6
<i>Benton</i>	Ironclad (conversion)	202'/72'/9'	16 guns	2.5" Iron	5.5
<i>Choctaw</i>	Ironclad (conversion)	260'/45'/8'	6 guns	1" Iron + 1" rubber	?
<i>Lafayette</i>	Ironclad (conversion)	280'/45'/8'	10 guns	2.5" Iron + 2" rubber	4
<i>Queen of the West</i>	Ellet Ram	181'/36'/6'	Ram 4 guns	None	?
<i>General Price</i>	Ram (captured)	182'/30'/13'	Ram 4 guns	None	10
<i>Cricket</i>	Tinclid	154'/28'/4'	6 guns	½" Iron	6
<i>Black Hawk</i>	Large Tinclid	260'/45'/6'	11 guns	½" Iron	?
<i>Tyler</i>	Timberclad	180'/45'/6'	10 guns	Wood planking	8

Weapons

Infantry

During the 1850s, in a technological revolution of major proportions, the rifle-musket began to replace the relatively inaccurate smoothbore musket in ever-increasing numbers, both in Europe and America. This process, accelerated by the Civil War, ensured that the rifled shoulder weapon would be the basic weapon used by infantrymen in both the Federal and Confederate armies.

The standard and most common shoulder weapon used in the American Civil War was the Springfield .58-caliber rifle-musket, models 1855, 1861, and 1863. In 1855, the U.S. Army adopted this weapon to replace the .69-caliber smoothbore musket and the .54-caliber rifle. In appearance, the rifle-musket was similar to the smoothbore musket. Both were single-shot muzzleloaders, but the rifled bore of the new weapon substantially increased its range and accuracy. The rifling system chosen by the United States was designed by Claude Minié, a French Army officer. Whereas earlier rifles fired a round, nonexpanding ball, the Minié system used a hollow-based cylindro-conoidal projectile, slightly smaller than the bore, which could be dropped easily into the barrel. When the powder charge was ignited by a fulminate of mercury percussion cap, the released propellant gases expanded the base of the bullet into the rifled grooves, giving the projectile a ballistic spin.

The Model 1855 Springfield rifle-musket was the first regulation arm to use the hollow-base .58-caliber Minié bullet. The slightly modified Model 1861 was the principal infantry weapon of the Civil War, although two subsequent models were produced in about equal quantities. The Model 1861 was fifty-six inches long, had a forty-inch barrel, and weighed 8.75 pounds. It could be fitted with a twenty-one inch socket bayonet (with an eighteen-inch blade, three inch socket) and a rear sight graduated to 500 yards. The maximum effective range of the Springfield rifle-musket was approximately 500 yards, although it had killing power at 1,000 yards. The round could penetrate 11 inches of white pine board at 200 yards and 3¾ inches at 1,000 yards, with a penetration of one inch being considered the equivalent of disabling a human being. Range and accuracy were increased by the use of the new weapon, but the soldiers' vision was still obscured by the dense clouds of smoke produced by its black powder propellant.

To load a muzzleloading rifle, the soldier took a paper cartridge in hand, tore the end of the paper with his teeth, poured the powder down the barrel, and placed a bullet in the muzzle. Then, using a metal ramrod, he pushed the bullet firmly down the barrel until seated. He then cocked the hammer and placed the percussion cap on the cone or nipple, which, when struck by the hammer, ignited the gunpowder. The average rate of fire was three rounds per minute. A well-trained soldier could possibly load and fire four times per minute, but in the confusion of battle, the rate of fire was probably slower, two to three rounds per minute.

In addition to the Springfields, over one hundred types of muskets, rifles, and rifled muskets—ranging up to .79-caliber—were used during the American Civil War. The numerous American-made weapons were supplemented early in the conflict by a wide variety of imported models. The best, most popular, and most numerous of the foreign weapons was the British .577-caliber Enfield rifle, Model 1853. Fifty-four inches long (with a 39-inch barrel), the rifle weighed 8.7 pounds (9.2 with the bayonet), could be fitted with a socket bayonet with an eighteen-inch blade, and had a rear sight graduated to a range of 800 yards. The Enfield design was produced in a variety of forms, both long and short barreled, by several British manufacturers and at least one American company. Of all the foreign designs, the Enfield most closely resembled the Springfield in characteristics and capabilities. The United States purchased over 436,000 Enfield-pattern weapons during the war. Statistics on Confederate purchases are more difficult to ascertain, but a report dated February 1863 indicates that 70,980 long Enfields and 9,715 short Enfields had been delivered by that time, with another 23,000 awaiting delivery.

While the quality of imported weapons varied, experts considered the Enfields and the Austrian Lorenz rifle-muskets very good. Some foreign governments and manufacturers took advantage of the huge initial demand for weapons by dumping their obsolete weapons on the American market. This practice was especially prevalent with some of the older smoothbore muskets and converted flintlocks. The greatest challenge, however, lay in maintaining these weapons and supplying ammunition and replacement parts for calibers ranging from .44 to .79. The quality of the imported weapons eventually improved as the procedures, standards, and astuteness of the purchasers improved. For the most part, the European suppliers provided needed weapons, and the newer foreign weapons were highly regarded.

All told, the United States purchased about 1,165,000 European rifles and muskets during the war, nearly all within the first two years. Of these, 110,853 were smoothbores. The remainder were primarily the French Minié rifles (44,250), Prussian rifles (59,918), and Austrian Model 1854s (266,294), Bokers (187,533), and Jagers (29,850). Estimates of total Confederate purchases range from 340,000 to 400,000. In addition to the Enfields delivered to the Confederacy (mentioned above), 27,000 Austrian rifles, 21,040 British muskets, and 2,020 Brunswick rifles were also purchased, with 30,000 Austrian rifles awaiting shipment.

Breechloaders and repeating rifles were available by 1861 and were initially purchased in limited quantities, often by individual soldiers. Generally, however, they were not issued to troops in large numbers because of technical problems (poor breech seals, faulty ammunition), fear by the Ordnance Department that the troops would waste ammunition, and the cost of rifle production. The most famous of the breechloaders was the single-shot Sharps, produced in both carbine and rifle models. The Model 1859 .52-caliber rifle was 47½ inches long, and weighed 8¾ pounds, while the carbine was .52 caliber and 39½ inches long and weighed 7¾ pounds. Both weapons used a linen cartridge and a pellet-primer-feed mechanism. Most Sharps carbines were issued to Federal cavalry units.

The best known of the repeaters was probably the seven-shot, .52-caliber Spencer, which also came in both rifle and carbine models. The rifle was 47 inches long and weighed 10 pounds, while the carbine was 39 inches long and weighed 8¼ pounds. The first mounted infantry unit to use Spencer repeating rifles in combat was Colonel John T. Wilder's "Lighting Brigade" on 24 June 1863 at Hoover's Gap, Tennessee. The Spencer was also the first weapon adopted by the U.S. Army that fired a metallic, rimfire, self-contained cartridge. Soldiers loaded rounds through an opening in the butt of the stock, which fed into the chamber through a tubular magazine by the action of the trigger guard. The hammer still had to be cocked manually before each shot.

Better than either the Sharps or the Spencer was the Henry rifle. Never adopted by the U.S. Army in large quantity, it was purchased privately by soldiers during the war. The Henry was a sixteen-shot, .44-caliber rimfire cartridge repeater. It was 43½ inches long and weighed 9¼ pounds. The tubular magazine located directly beneath the barrel had a fifteen-round capacity with an additional round in the

chamber. Of the approximate 13,500 Henrys produced, probably 10,000 saw limited service. The government purchased only 1,731.

The Colt repeating rifle (or revolving carbine), Model 1855, also was available to Civil War soldiers in limited numbers. The weapon was produced in several lengths and calibers, the lengths varying from 32 to 42½ inches, while calibers were .36, .44, and .56. The .36 and .44 calibers were made to chamber six shots, while the .56 caliber had five chambers. The Colt Firearms Company was also the primary supplier of revolvers, the .44-caliber Army revolver and the .36-caliber Navy revolver being the most popular (over 146,000 purchased) because they were simple, sturdy, and reliable.

Cavalry

Initially armed with sabers and pistols (and, in one case, lances), Federal cavalry troopers quickly added the breechloading carbine to their inventory of weapons. However, one Federal regiment, the 6th Pennsylvania Cavalry, carried lances until 1863. Troopers preferred the easier-handling carbines to rifles and the breechloaders to awkward muzzleloaders. Of the single-shot breechloading carbines that saw extensive use during the Civil War, the Hall .52 caliber accounted for approximately 20,000 in 1861. The Hall was quickly replaced by a variety of carbines, including the Merrill .54 caliber (14,495), Maynard .52 caliber (20,002), Gallagher .53 caliber (22,728), Smith .52 caliber (30,062), Burnside .56 caliber (55,567), and Sharps .54 caliber (80,512). The next step in the evolutionary process was the repeating carbine, the favorite by 1865 being the Spencer .52-caliber, seven-shot repeater (94,194). Because of the South's limited industrial capacity, Confederate cavalymen had a more difficult time arming themselves. Nevertheless, they too embraced the firepower revolution, choosing shotguns and muzzleloading carbines as their primary weapons. In addition, Confederate cavalymen made extensive use of battlefield salvage by recovering Federal weapons. However, the South's difficulties in producing the metallic-rimmed cartridges required by many of these recovered weapons limited their usefulness.

Artillery

Artillery in the Civil War era consisted of four general weapon types—guns, howitzers, mortars, and columbiads. Guns were long-barreled cannon that delivered high-velocity, flat-trajectory, long-range fire. Howitzers were lighter and shorter than guns, and used

a smaller powder charge to fire explosive projectiles at shorter distances. Mortars, the shortest pieces, used a small powder charge to lob a large projectile at a very high angle. Columbiads combined characteristics of all three. They were generally of large caliber, possessed relatively long barrels, and used a large powder charge to fire a heavy projectile great distances.

Artillery was also categorized as to method of employment—field, siege (officially classified as “siege and garrison”), and seacoast. Field artillery, the lightest and most mobile, operated within tactical units as part of the standard combined arms team. Siege and seacoast artillery operated more or less independently of the other combat arms. Siege artillery units normally formed siege trains that were called to the front only under special circumstances. Seacoast artillery, the heaviest Civil War ordnance, was emplaced in fixed positions.

Field Artillery

In 1841, the U. S. Army selected bronze as the standard material for field pieces and at the same time adopted a new system of field artillery. The 1841 field artillery system consisted entirely of smoothbore muzzleloaders: 6- and 12-pounder guns; 12-, 24-, and 32-pounder howitzers; and 12-pounder mountain howitzers. A pre-Civil War battery usually consisted of six field pieces—four guns and two howitzers. A 6-pounder battery contained four 6-pounder guns and two 12-pounder howitzers, while a 12-pounder battery had four 12-pounder guns and two 24-pounder howitzers. The guns fired solid shot, shell, spherical case, grapeshot, and canister rounds, while howitzers fired shell, spherical case, grapeshot, and canister rounds.

The 6-pounder gun (effective range 1,523 yards) was the primary field piece used from the time of the Mexican War until the Civil War. By 1861, however, the 1841 system based upon the 6-pounder was obsolete. In 1857, a new and more versatile field piece, the 12-pounder gun-howitzer (Napoleon), Model 1857, appeared on the scene. Designed as a multipurpose piece to replace existing guns and howitzers, the Napoleon fired canister and shell like the 12-pounder howitzer and solid shot at ranges comparable to the 12-pounder gun. The Napoleon was a bronze, muzzleloading smoothbore with an effective range of 1,680 yards using solid shot (see table 5 for a comparison of artillery data). Served by a nine-man crew, the piece could fire at a sustained rate of two aimed shots per minute. With less than fifty Napoleons initially available in 1861, obsolete 6-pounders

remained in the inventories of both armies for some time, especially in the western theater.

Another new development in field artillery was the introduction of rifling. Although rifled guns provided greater range and accuracy, they were somewhat less reliable and slower to load than smoothbores. (Rifled ammunition was semi-fixed, so the charge and the projectile had to be loaded separately.) Moreover, the canister load of the rifle did not perform as well as that of the smoothbore. Initially, some smoothbores were rifled on the James pattern, but they soon proved unsatisfactory because the bronze rifling eroded too quickly. Therefore, most rifled artillery was either wrought iron or cast iron with a wrought iron reinforcing band.

The most common rifled guns were the 10-pounder Parrott and the Rodman, or 3-inch, ordnance rifle. The Parrott rifle was a cast-iron piece, easily identified by the wrought-iron band reinforcing the breech. The 10-pounder Parrott was made in two models: the Model 1861 had a 2.9-inch rifled bore with three lands and grooves and a slight muzzle swell, while the Model 1863 had a 3-inch bore and no muzzle swell. The Rodman or Ordnance rifle was a long-tubed, wrought-iron piece that had a 3-inch bore with seven lands and grooves. Ordnance rifles were sturdier than the 10-pounder Parrott and displayed superior accuracy and reliability.

By 1860, the ammunition for field artillery consisted of four general types for both smoothbores and rifles: solid shot, shell, case, and canister. Solid shot for smoothbores was a round, cast-iron projectile; for rifled guns it took the form of an elongated projectile known as a bolt. Solid shot, with its smashing or battering effect, was used in a counterbattery role or against buildings and massed troop formations. The rifle's conical-shaped bolt lacked the effectiveness of the smoothbore's cannonball because it tended to bury itself upon impact instead of bounding along the ground like round shot.

Shell, also known as common or explosive shell, whether spherical or conical, was a hollow projectile filled with an explosive charge of black powder detonated by a fuse. Shell was designed to break into jagged pieces, producing an antipersonnel effect, but the low-order detonation seldom produced more than three to five fragments. In addition to its casualty producing effects, shell had a psychological impact when it exploded over the heads of troops. It was also used against field fortifications and in a counterbattery role. Case or case

shot for both smoothbore and rifled guns was a hollow projectile with thinner walls than shell. The projectile was filled with round lead or iron balls set in a matrix of sulphur that surrounded a small bursting charge. Case was primarily used in an antipersonnel role. This type of round had been invented by Henry Shrapnel, a British artillery officer, hence the term “shrapnel.”

Lastly, there was canister, probably the most effective round and the round of choice at close range (400 yards or less) against massed troops. Canister was essentially a tin can filled with iron balls packed in sawdust, with no internal bursting charge. When fired, the can disintegrated, and the balls followed their own paths to the target. The canister round for the 12-pounder Napoleon consisted of twenty-seven 1½ inch iron balls packed inside an elongated tin cylinder. At extremely close ranges, artillerymen often loaded double charges of canister.

Heavy Artillery—Siege and Seacoast

The 1841 artillery system listed eight types of siege artillery and another six types as seacoast artillery. The 1861 *Ordnance Manual* included eleven different kinds of siege ordnance. The principal siege weapons in 1861 were the 4.5-inch rifle; 18-, and 24-pounder guns; a 24-pounder howitzer and two types of 8-inch howitzers; and several types of 8- and 10-inch mortars. The normal rate of fire for siege guns and mortars was about twelve rounds per hour, but with a well-drilled crew, this could probably be increased to about twenty rounds per hour. The rate of fire for siege howitzers was somewhat lower, being about eight shots per hour.

The carriages for siege guns and howitzers were longer and heavier than field artillery carriages but were similar in construction. The 24-pounder model 1839 was the heaviest piece that could be moved over the roads of the day. Alternate means of transport, such as railroad or watercraft, were required to move larger pieces any great distance.

The rounds fired by siege artillery were generally the same as those fired by field artillery, except that siege artillery continued to use grapeshot after it was discontinued in the field artillery (1841). A “stand of grape” consisted of nine iron balls, ranging from two to about three and one-half inches in size depending on the gun caliber.

The largest and heaviest artillery pieces in the Civil War era belonged to the seacoast artillery. These large weapons were normally



A 13-inch mortar, now located on the grounds of the Grand Gulf Museum.

mounted in fixed positions. The 1861 system included five types of columbiads, ranging from 8- to 15-inch; 32- and 42-pounder guns; 8- and 10-inch howitzers; and mortars of 10- and 13-inches.

Wartime additions to the Federal seacoast artillery inventory included Parrott rifles, ranging from 6.4-inch to 10-inch (300-pounder). New columbiads, developed by Ordnance Lieutenant Thomas J. Rodman, included 8-inch, 10-inch, and 15-inch models. The Confederates produced some new seacoast artillery of their own—Brooke rifles in 6.4-inch and 7-inch versions. They also imported weapons from England, including 7- and 8-inch Armstrong rifles, 6.3-to12.5-inch Blakely rifles, and 5-inch Whitworth rifles.

Seacoast artillery fired the same projectiles as siege artillery but with one addition - hot shot. As its name implies, hot shot was solid shot heated in special ovens until red-hot, then *carefully* loaded and fired as an incendiary round.

Naval Ordnance

Like the Army, the U.S. Navy in the Civil War possessed an artillery establishment that spanned the spectrum from light to heavy. A series of light boat guns and howitzers corresponded to the Army's field

artillery. Designed for service on small boats and launches, this class of weapon included 12- and 24-pounder pieces, both smoothbore and rifled. The most successful boat gun was a 12-pounder smoothbore howitzer (4.62-inch bore) designed by John A. Dahlgren, the Navy's premier ordnance expert and wartime chief of ordnance. Typically mounted in the bow of a small craft, the Dahlgren 12-pounder could be transferred, in a matter of minutes, to an iron field carriage for use on shore. This versatile little weapon fired shell and case rounds.

Naturally, most naval artillery was designed for ship killing. A variety of 32-pounder guns (6.4-inch bore) produced from the 1820s through the 1840s remained in service during the Civil War. These venerable smoothbores, direct descendants of the broadside guns used in the Napoleonic Wars, fired solid shot and were effective not only in ship-to-ship combat but also in the shore-bombardment role.

A more modern class of naval artillery weapons was known as "shellguns." These were large-caliber smoothbores designed to shoot massive exploding shells that were capable of dealing catastrophic damage to a wooden-hulled vessel. Shellguns could be found both in broadside batteries and in upper-deck pivot mounts, which allowed wide traverse. An early example of the shellgun, designed in 1845 but still in service during the Civil War, was an 8-inch model that fired a 51-pound shell.

John Dahlgren's design came to typify the shellgun class of weapons. All of his shellguns shared an unmistakable "beer-bottle" shape. The most successful Dahlgren shellguns were a 9-inch model (72.5-pound shell or 90-pound solid shot), an 11-inch (136-pound shell or 170-pound solid shot), and a 15-inch, which fired an awesome 330-pound shell or 440-pound solid shot. A pivot-mounted 11-inch shellgun proved to be the decisive weapon in the *U.S.S. Kearsarge's* 1864 victory over the *C.S.S. Alabama*. The famous U.S. Navy ironclad *Monitor* mounted two 11-inch Dahlgrens in its rotating turret. Later monitors carried 15-inch shellguns.

The U.S. Navy also made wide use of rifled artillery. These high-velocity weapons became increasingly important with the advent of ironclad warships. Some Navy rifles were essentially identical to Army models. For instance, the Navy procured Parrott rifles in 4.2-inch, 6.4-inch, 8-inch, and 10-inch versions, each of which had a counterpart in the Army as either siege or seacoast artillery. Other rifled weapons, conceived specifically for naval use, included two Dahlgren designs. The 50-pounder (with approximately 5-inch bore)

Table 5. Types of Artillery Available in the Vicksburg Campaign

FIELD ARTILLERY

<i>Type</i>	<i>Model</i>	<i>Bore Dia. (in.)</i>	<i>Tube Length (in.)</i>	<i>Tube wt. (lbs.)</i>	<i>Carriage wt. (lbs.)</i>	<i>Range (yds) /deg. elev.</i>
Smoothbores						
6-pounder	Gun	3.67	65.6	884	900	1,523/5°
12-pounder "Napoleon"	Gun- Howitzer	4.62	72.15	1,227	1,128	1,680/5°
12-pounder	Howitzer	4.62	58.6	788	900	1,072/5°
24-pounder	Howitzer	5.82	71.2	1,318	1,128	1,322/5°
Rifles						
10-pounder	Parrott	3.0	78	890	900	2,970/10°
3-inch	Ordnance	3.0	73.3	820	900	2,788/10°
20-pounder	Parrott	3.67	89.5	1,750		4,400/15°

SIEGE AND GARRISON

<i>Type</i>	<i>Model</i>	<i>Bore Dia. (in)</i>	<i>Tube Length (in)</i>	<i>Tube wt. (lbs)</i>	<i>Projectile wt. (lbs)</i>	<i>Range (yds) /deg. elev.</i>
Smoothbores						
8-inch	Howitzer	8.0	61.5	2,614	50.5 shell	2,280/12° 30'
10-inch	Mortar	10.0	28.0	1,852	87.5 shell	2,028/45°
12-pounder	Gun	4.62	116.0	3,590	12.3 shot	
24-pounder	Gun	5.82	124.0	5,790	24.4 shot	1,901/5°
Rifles						
18-pounder*	Gun (Rifled)	5.3	123.25			
30-pounder	Parrott	4.2	132.5	4,200	29.0 shell	6,700/25°

*The Confederate "Whistling Dick," an obsolete smoothbore siege gun, rifled and banded.

**Table 5. Types of Artillery Available in the Vicksburg Campaign
(Cont)**

SEACOAST

<i>Type</i>	<i>Model</i>	<i>Bore Dia. (in)</i>	<i>Tube Length (in)</i>	<i>Tube wt. (lbs)</i>	<i>Projectile wt. (lbs)</i>	<i>Range (yds) /deg. elev.</i>
Smoothbores						
8- inch	Columbiad	8.0	124	9,240	65 shot	4,812/27° 30'
9- inch*	Dahlgren	9.0				
10- inch	Columbiad	10.0	126	15,400	128 shot	5,654/39° 15'
11- inch	Dahlgren	11.0	161	15,700		3,650/20°
32- pounder	Gun	6.4	125.7	7,200	32.6 shot	1,922/5°
42- pounder	Gun	7.0	129	8,465	42.7 shot	1,955/5°
Rifles						
6.4- inch	Brooke	6.4	144	9,120		
7- inch	Brooke	7.0	147.5	14,800		
7.5- inch**	Blakely	7.5	100			
100- pounder	Parrott	6.4	155	9,700	100 shot	2,247/5°

*A Confederate-produced copy of Dahlgren's basic design.

**The famous Confederate "Widow Blakely." Probably a British 42-pounder smoothbore shortened, banded, and rifled.

*NAVAL**

<i>Type</i>	<i>Model</i>	<i>Bore Dia. (in)</i>	<i>Tube Length (in)</i>	<i>Tube wt. (lbs)</i>	<i>Projectile wt. (lbs)</i>	<i>Range (yds) /deg. elev.</i>
Smoothbores						
8- inch	Dahlgren	8	115.5	6,500	51 shell	1,657/5°
9- inch	Dahlgren	9	131.5	9,000	72.5 shell	1,710/5°
11- inch	Dahlgren	11	161	15,700	136 shell	1,712/5°
12- pounder	Howitzer	4.62	63.5	760	10 shell	1,085/5°
24- pounder	Howitzer	5.82	67	1,310	20 shell	1,270/5°
32- pounder	Gun	6.4	108	4,704	32 shot	1,756/5°
64- pounder	Gun	8	140.95	11,872		
Rifles						
30- pounder	Parrott	4.2	112	3,550	29 shell	2,200/5°
42- pounder**	Gun (rifled)	7	121	7,870	42 shot	
50- pounder	Dahlgren	5.1	107	6,000	50 shot	
100- pounder	Parrott	6.4	155	9,700	100 shot	2,200/5°
Mortar						
13- inch	Mortar	13	54.5	17,120	200 shell	4,200/45°

*Some naval guns served ashore as siege artillery. Moreover, many guns mounted on the boats of the Mississippi River Squadron were in fact Army field artillery and siege guns.

**Converted smoothbore.